

National Aeronautics and  
Space Administration

The background of the slide is a deep blue space scene filled with stars. On the left side, there is a silhouette of a human head in profile, facing right. Inside the head, a bright sun or star is shining, with rays of light extending outwards. To the left of the head, a cluster of celestial bodies is arranged, including Saturn with its rings, Jupiter, and several moons of varying sizes and colors (orange, grey, brown).

# YEAR OF THE SOLAR SYSTEM

***Presentation to***  
**Education and Public Outreach Committee**  
**of the**  
**NASA Advisory Council**

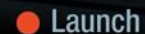
**Dr. James Green**  
Director, NASA Planetary Science

February 8, 2011



Planetary Science Division's strategic approach to communications is to raise awareness, build excitement and make connections with the American public and other target audiences on upcoming planetary science activities and discoveries.

***“The Year of the Solar System presents a unique opportunity for NASA to raise awareness in a way that allows everyone to better understand our Solar System and consequently planet Earth.”***



# JANUARY

## NASM

### Mars Program Update

## FEBRUARY

## Stardust NExT

### Mars Program Update

# MARCH

**MESSENGER**  
Orbit Insertion

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**New Horizons**  
Passes Uranus

## APRIL

**STEREO**  
Full view of Sun

## MAY

**JPL/GSFC**  
Open House

# JUNE

## Aquarius Launch ●

## JULY

## DAWN

### Arrives at Vesta

## AUGUST

## Juno Launch

# SEPTEMBER

## GRAIL Launch ●

# OCTOBER

## NPP Launch ●

# NOVEMBER

MSL Launch ●

# DECEMBER

## SOFIA Highlight



# The Environment We Are In

Historic time in planetary science is *now*

- There is a scientific revolution going on in planetary science
- Old theories giving way to new ideas and new knowledge

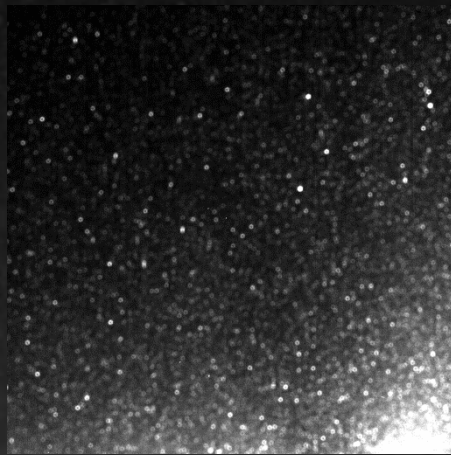
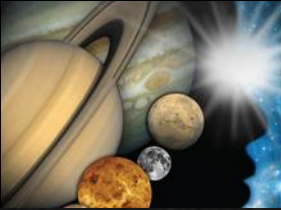
Discoveries are happening almost daily - this is not by accident

- We are reaping the benefits of our technology investments and missions
- NASA's Planetary Division has 16 operating missions and 6 in formulation/development

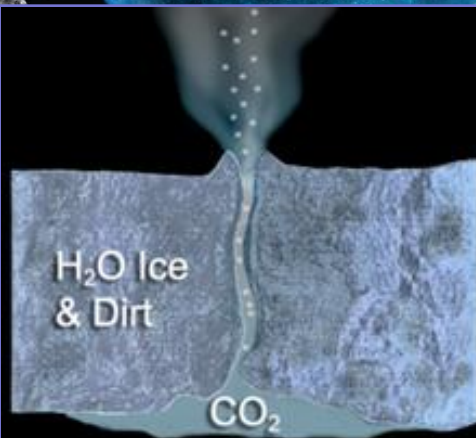
Recent examples:

- Cometary Science: Comet Hartley 2 encounter November 4, 2010
- Astrobiology: A microbe that has substituted Arsenic for Phosphorus in DNA structure. Announcement December 2, 2010

# Comet Hartley 2



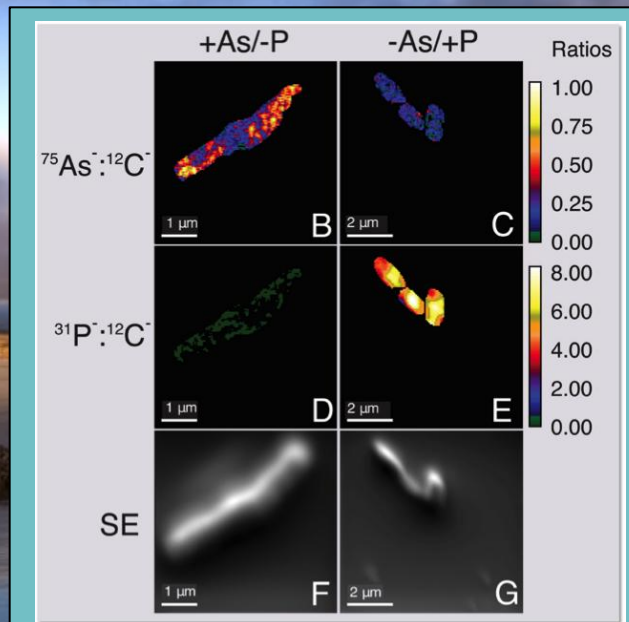
## Hartley 2 - Ejection of the Snowballs



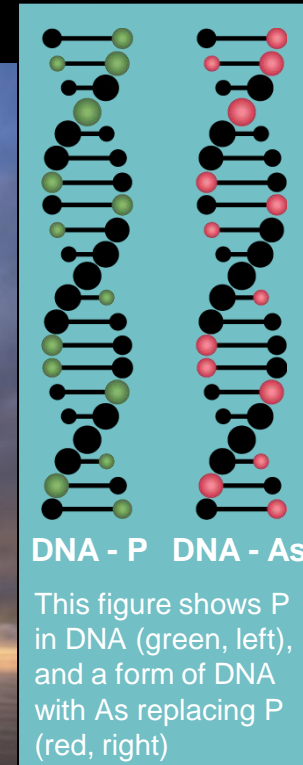
CO<sub>2</sub> jets drag water ice out of nucleus, producing a 'comet snowstorm.'

# Reconsidering Life on Earth and Beyond Bacteria That Use Arsenic Instead of Phosphorus

5 <u>B</u>	6 <u>C</u>	7 <u>N</u>	8 <u>O</u>	9 <u>F</u>
13 <u>Al</u>	14 <u>Si</u>	15 <u>P</u>	16 <u>S</u>	17 <u>Cl</u>
31 <u>Ga</u>	32 <u>Ge</u>	33 <u>As</u>	34 <u>Se</u>	35 <u>Br</u>



When grown with As and no P, the microbes had lots of As (panel B), little P (panel D) and was much larger (panel F) compared to cells grown on P and no As (panels C, E, and G, respectively).



The As-utilizing microbes were isolated from Mono Lake, a harsh environment in California with extremely high levels of As.



# Year of the Solar System

So what is the Year of the Solar System all about?

- An organizing construct to better communicate with target audiences
- Raises awareness on current missions and discoveries and builds excitement on what is going to happen next
- Makes connections on “Why People Should Care”
- Web-based catalog of EPO materials

Theme: *New Worlds, New Discoveries*

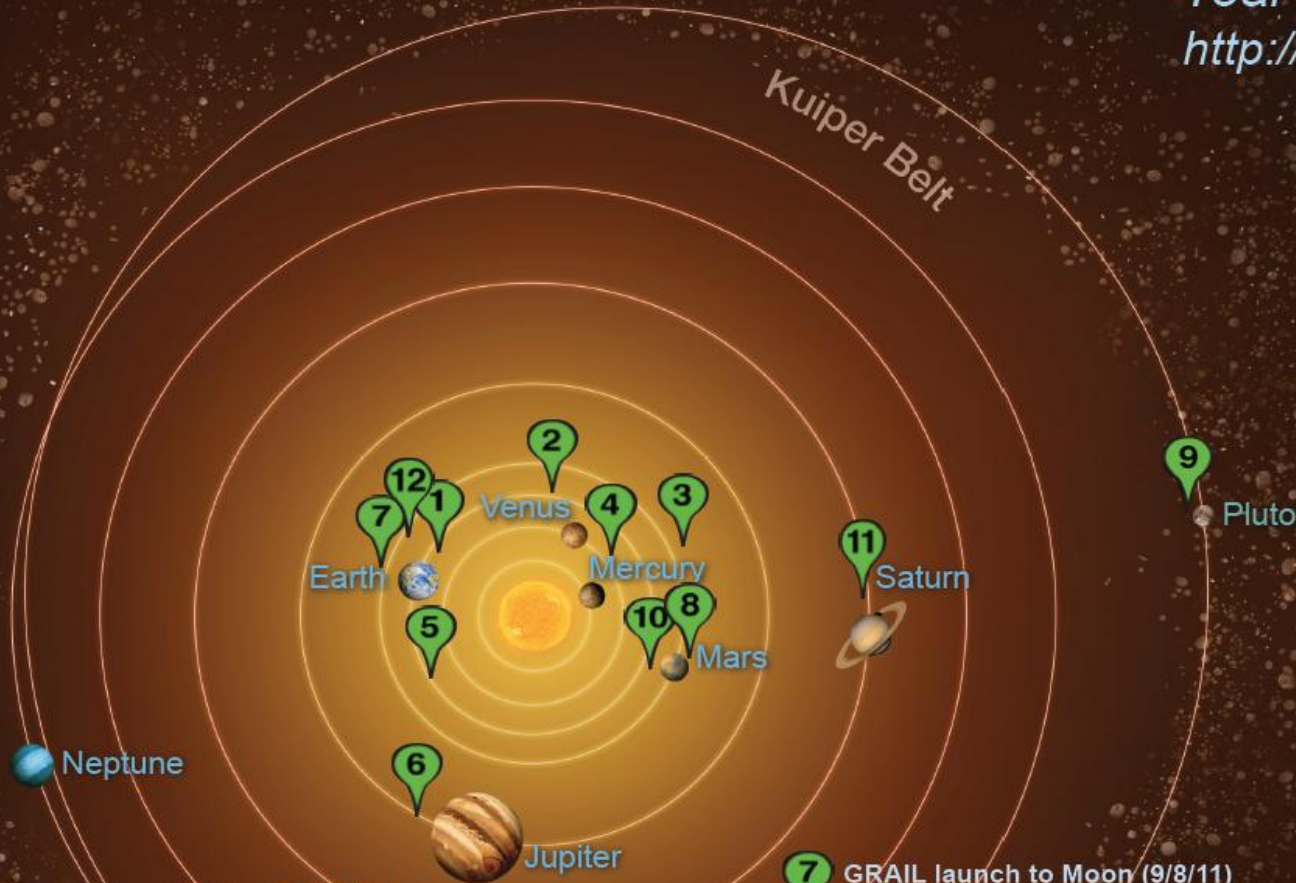
Kick-off: October 2010 through September 2012 (It's a Martian year)

External Website: [solarsystem.nasa.gov](http://solarsystem.nasa.gov)

# NASA Planetary Science

*Year of the Solar System*

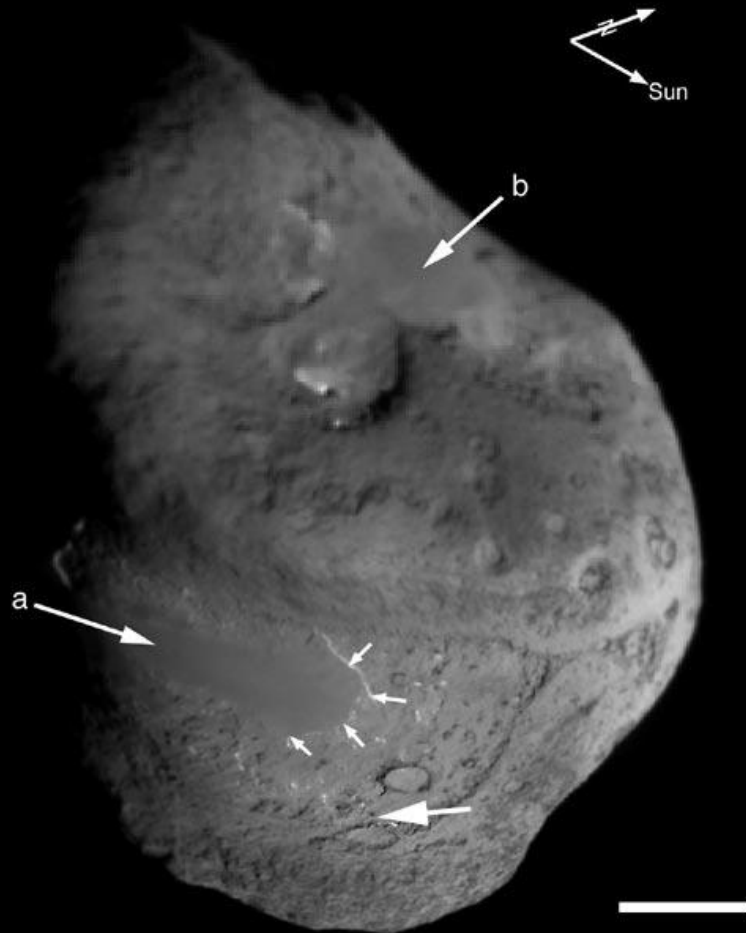
<http://solarsystem.nasa.gov>



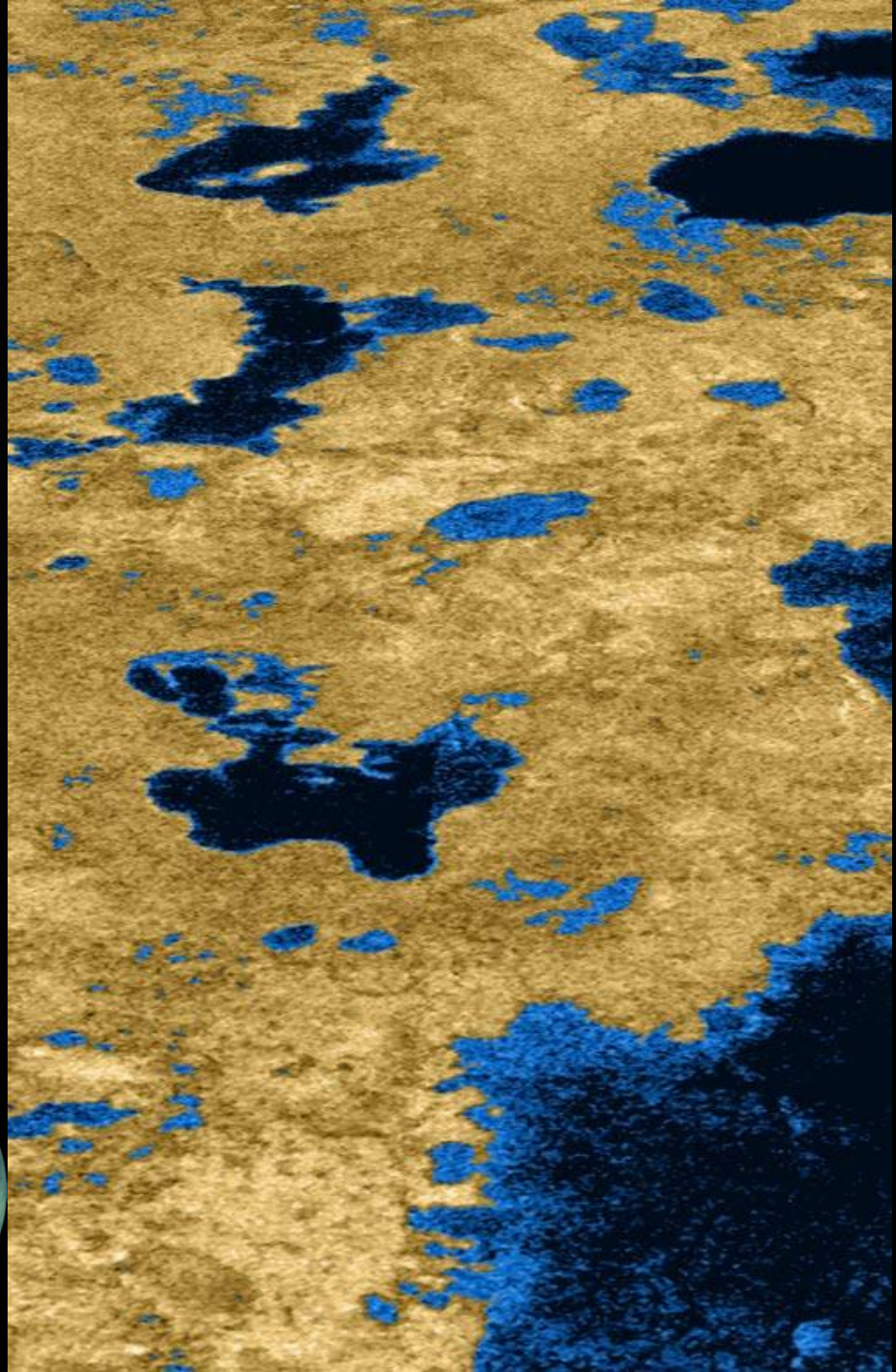
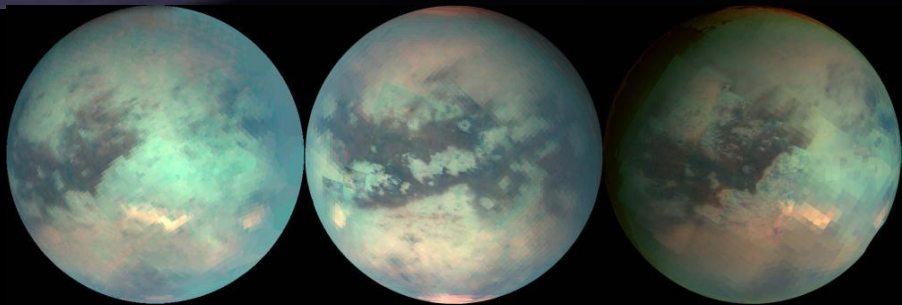
- 1 EPOXI encounters Hartley 2 (11/4/10)
- 2 Venus Climate Orbiter (12/7/10)
- 3 Stardust NExT encounters Tempel (2/14/11)
- 4 MESSENGER Orbit insertion at Mercury (3/18/11)
- 5 Dawn Orbit insertion at Vesta (July 2011)
- 6 Juno Launch to Jupiter (8/5/11)
- 7 GRAIL launch to Moon (9/8/11)
- 8 MSL launch to Mars (11/25/11); arrives (Aug 2012)
- 9 New Horizons launched to Pluto (1/19/06); Arrives Pluto (7/14/15)
- 10 Rovers Spirit/Opportunity launched to Mars (6/10/03 and 7/7/03)
- 11 Cassini launched (10/15/97); arrived Jupiter (12/30/00), Saturn (7/1/04), Titan (2/15/05), still operational
- 12 Lunar Reconnaissance Orbiter (6/18/09), still operational

As of 11/30/11

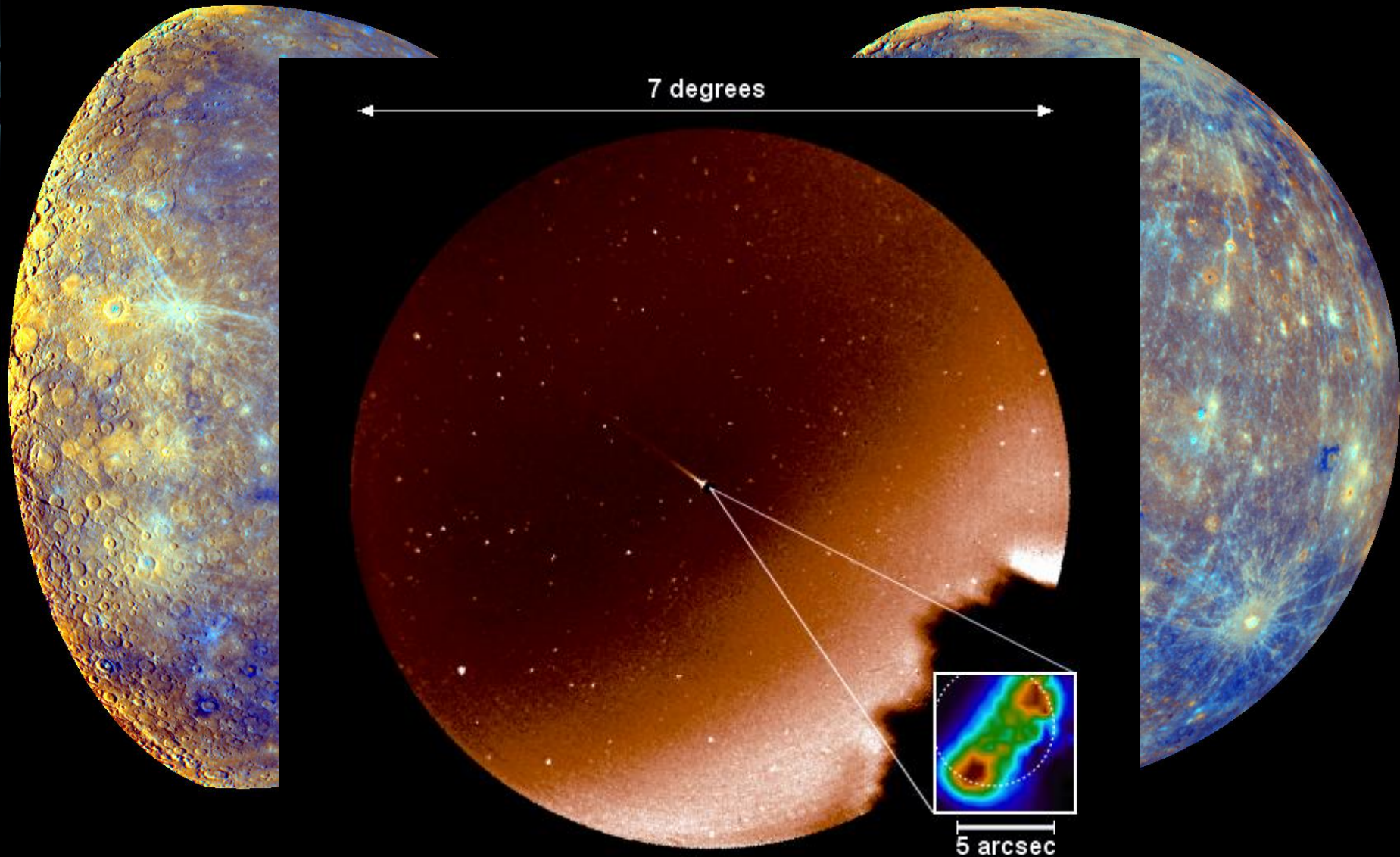
# Comet Tempel 1 – Stardust NExT will re-encounter on February 14



# Saturn's Moon Titan



# Mercury – MESSENGER March 17





# Some Recent EPO Events



**2010**

**\*September 16 – LRO transfer to SMD**

- \*September 10 – 25<sup>th</sup> Anniversary of the First Comet Encounter, Newseum
- \*September 18 – International Observe the Moon night
- \*September 30 – Opening of Dulles Gateway Gallery
- \*October 1 – Year of the Solar System EPO kick-off
- \*October 3-8 – DPS, Pasadena CA
- \*October 14 – 50<sup>th</sup> Anniversary of Astrobiology
- \*October 23-24 – US Science and Engineering Festival
- \*October 26 – Public release of Eyes on the Solar System multimedia web feature
- \*October 27 – Library of Congress lecture by A. Davies on Volcanoes

**\*November 4 - EPOXI encounters Comet Hartley 2**

- \*November 4 - TEDxNASA event @ Newport News, VA

**\* November 19 - Launch of O/OREOS**

- \*November 20 - TEDxYouth NASA event @ VASC and NASA Centers
- \*December 2 – Astrobiology Announcement: Arsenic Organism

**\* December 7- Venus Climate Orbiter (JAXA) at Venus (failed to get into orbit)**

- \*December 7 – Colloquium @ Virginia Air and Space Center
- \*December 13-17 – AGU

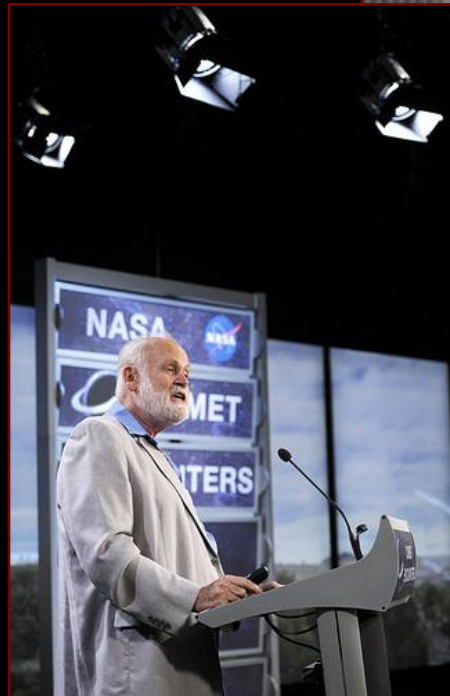
<p>* Completed Blue = Mission Events White = StratComm Events</p>
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# First Comet Encounter Outreach Event

Successful live event on 9/10/2010 at the Newseum, celebrating the 25<sup>th</sup> anniversary of the first Comet Encounter. Speakers included preeminent scientists in the field:

- Dr. Jim Green, Director, NASA Planetary Science Division
- Dr. Anita Cochran, Assistant Director, McDonald Observatory, The University of Texas at Austin
- Dr. Robert Farquhar, Executive for Space Exploration, KinetX, Inc.
- Dr. Michael A'Hearn, Principal Investigator, EPOXI Comet Encounter mission
- Dr. Joseph Veverka, Principal Investigator, Stardust NExT Comet Encounter mission

<http://www.youtube.com/nasatelevision#p/u/201/YOT-lj6bv9M>



# Exo/Astrobiology 50<sup>th</sup> Anniversary Symposium

National Aeronautics and Space Administration

**SEEKING SIGNS OF LIFE:**  
A Symposium Celebrating the 50<sup>th</sup> Anniversary of NASA's Exo/Astrobiology Program

"Sponsored by NASA" and Lockheed Martin

**DATE:**  
Thursday, October 14, 2010

**TIME:**  
8 a.m. – 5 p.m.

**LOCATION:**  
Lockheed Martin Global Vision Center  
2121 Crystal Drive  
Arlington, VA 22202

NASA's Astrobiology Program addresses three fundamental questions: How does life begin and evolve? Is there life beyond Earth, and if so, how can we detect it? What is the future of life on Earth and in the universe? Experts in a range of relevant disciplines will engage in an exciting day of discussions . . . Are we alone?

Confirmed speakers include Baruch S. Blumberg, The Honorable Daniel S. Golein, David Grinspoon, Noel Hinners, James Lovelock, Lynn Margulis, and Steve Squyres.

Event is free, but kindly RSVP by October 7, 2010, to [www.nasa.gov/astrobiology](http://www.nasa.gov/astrobiology). Non-US citizens will need to provide nationality, passport #, and passport expiration date. Seating is extremely limited. Business attire requested.

www.nasa.gov

Seeking Signs of Life: A Symposium Celebrating the 50<sup>th</sup> Anniversary of NASA's Exobiology Program occurred on Thursday, October 14, 2010, from 9 a.m. – 4 p.m. at the Lockheed Martin Global Vision Center in Arlington, Virginia.

The event was webcast via Livestream on

[www.livestream.com/astrobiology50th](http://www.livestream.com/astrobiology50th)

As of Feb 7, 2011, over 714,800 viewer minutes, up from 162K right after the event.



# Dulles International Airport Gateway Gallery

## BEYOND: Visions of our Solar System



Artist Michael Benson, left, talks with Dr. James Green, Director, Planetary Science, NASA Headquarters, as they stand in front of images of Mars during a preview of a photography exhibition at Washington Dulles International Airport, Thursday, Sept. 30, 2010, in Chantilly, Va. NASA and the Metropolitan Washington Airports Authority unveiled the exhibit where ticketed travelers can view space science discoveries and relish the beauty and majesty of our solar system. "NASA presents BEYOND: Visions of our Solar System" will be shown at Dulles' Gateway Gallery through March 31, 2011. Photo Credit: (NASA/Paul E. Alers)

# Planetary Science

**TEDxNASA**  
x = independently organized TED event

**TED (Technology Entertainment Design)** is a global set of conferences formed to disseminate "ideas worth spreading". Since June 2006, the talks have been offered for free viewing online at TED.com.

TEDx is a program that enables schools, businesses, libraries or just groups of friends to enjoy a TED-like experience with TEDx Events they themselves organize, design and host

(Right) Jim Green presented an overview of planetary science, "The Seven Wonders of the Solar System", at the What Matters Next? TEDxNASA event on November 4 in Newport News, VA.



(Left) Jim Adams presented at the TEDxYouth@NASA event, Be Astronomical - An adventure in STEM and Self-Discovery!, on November 20 in Hampton, VA.

November 20, United Nations Universal Children's Day, was chosen by the TED organizers to host multiple events for youth across the world in every time zone over this 24-hour period.



# Mars Program Update

*From “Follow the Water” to “Seeking Signs of Life”*  
[livestream.com/mars](http://livestream.com/mars) and [www.youtube.com/nasatelevision](http://www.youtube.com/nasatelevision)

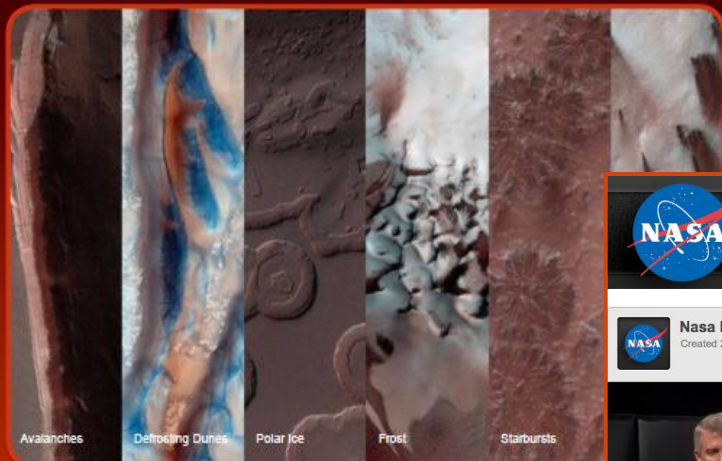


Smithsonian  
National Air and Space Museum

National Aeronautics and  
Space Administration



## MARS Program Update



January 13, 2011  
10:30 a.m.–12:30 p.m.  
National Air and Space Museum

A public forum was held at the National Air and Space Museum (NASM) on January 13, 2011, to evidence of water on Mars, current Mars missions and future Mars activities.

Three panels were moderated by Dr. John Grant (NASM Chair, Center of Earth and Planetary Studies):

- 1) Follow the Water: What Have We Found?
- 2) How Do We Do It? Status of Current Missions
- 3) Seeking Signs of Life: What Will the Future Bring?

Planetary Science Division panelists included Doug McCuistion, Michael Meyer and Mary Voytek. Other panel members included Jack Mustard (Brown University), Steve Squyers (Cornell University), Marcello Coradini (ESA) and Jennifer Eigenbrode (GSFC).



Standing room attendance at the event was over 200, including students from Stuart-Hopson Middle School and the Whittier Education Campus STEM School.

The event was carried live on NASA TV and on Livestream. As of February 7, Livestream reported over 103,900 viewer minutes, up from 22K after the event



# Upcoming Planetary Missions and Events



## 2011

\*January 13 - Mars Program Update @ NASM

February 12-13 – SpaceUp Houston, LPI, Houston, TX

February 13 - Book signing “Jars to the Stars” at NASM

February 20 – AAAS “Meet the Scientist” C. Conley, Washington DC

February 14 - Stardust NExT encounters comet Tempel 1

Early March – Planetary Decadal Survey released

March 7-11 –LPSC, Woodlands, TX

March and April – Decadal Town Halls

March 10-13 – NSTA, San Francisco, CA

March 17 - MESSENGER orbit insertion at Mercury (9:45 pm Eastern)

April 27 – 30 – FIRST Robotics Championship, St. Louis MO

June 29 – 50<sup>th</sup> Anniversary of Nuclear Space Power

July - Dawn orbit insertion at asteroid Vesta

July TBD – Mars Day @ NASM

August 5 - Juno launch to Jupiter

September 8 - GRAIL launch to the Moon

November 25 - MSL launch to Mars

## 2012

Mid 2012 -- Mars Opportunity Rover gets to Endeavour Crater

Mid-year -- Dawn leaves Vesta starts on its journey to Ceres

August - MSL lands on Mars

\* Completed

Blue = Mission Events

White = StratComm Events



# New Worlds, New Discoveries to Be Shared

Planetary science events and discoveries will cast  
“space” activities in a positive light seen by the public

Our previous emphasis has been on Higher Ed and K-12  
- Making great progress in these areas

We must learn to talk to the public in a way they can  
already relate to and go to where they go

- Museums, science centers, libraries, etc...
- Raise awareness, build excitement, make connections

Some examples are:



Dactyl  
[(243) Ida I]  
1.6 × 1.2 km  
Galileo, 1993

243 Ida - 58.8 × 25.4 × 18.6 km  
Galileo, 1993



9969 Braille  
2.1 × 1 × 1 km  
Deep Space 1, 1999

5535 Annefrank  
6.6 × 5.0 × 3.4 km  
Stardust, 2002

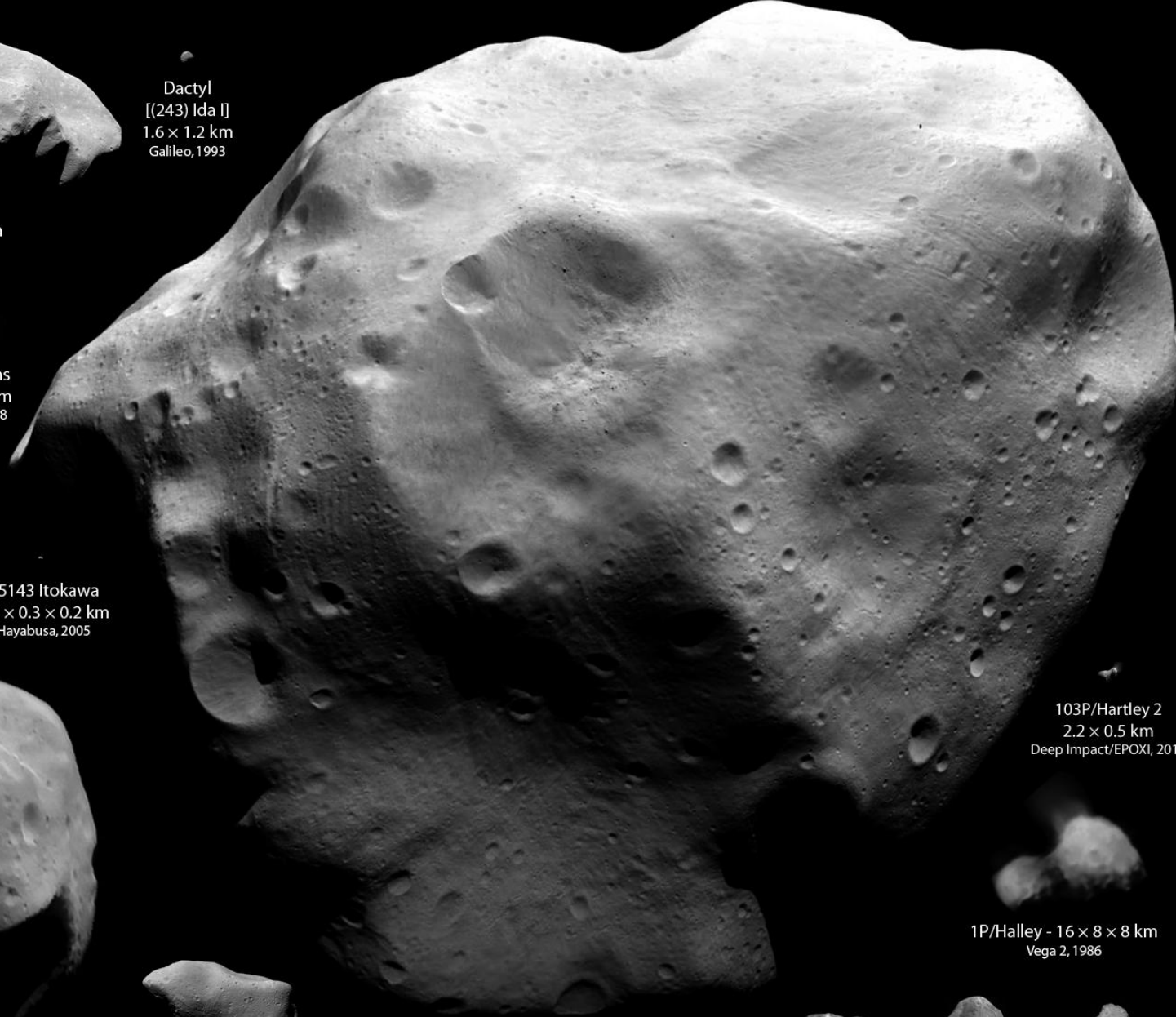
2867 Steins  
5.9 × 4.0 km  
Rosetta, 2008



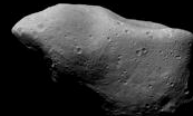
433 Eros - 33 × 13 km  
NEAR, 2000



25143 Itokawa  
0.5 × 0.3 × 0.2 km  
Hayabusa, 2005



103P/Hartley 2  
2.2 × 0.5 km  
Deep Impact/EPOXI, 2010



21 Lutetia - 132 × 101 × 76 km  
Rosetta, 2010



19P/Borrelly  
8 × 4 km  
Deep Space 1, 2001



9P/Tempel 1  
7.6 × 4.9 km  
Deep Impact, 2005



81P/Wild 2  
5.5 × 4.0 × 3.3 km  
Stardust, 2004

253 Mathilde - 66 × 48 × 44 km  
NEAR, 1997

951 Gaspra - 18.2 × 10.5 × 8.9 km  
Galileo, 1991

# Dawn Gets in Orbit Around Vesta in July

## Vesta and Ceres Size

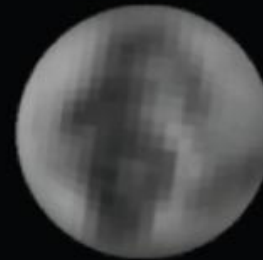
Lutetia



Vesta



Ceres



Pluto

California  
(smog not shown)



Texas



Earth's moon

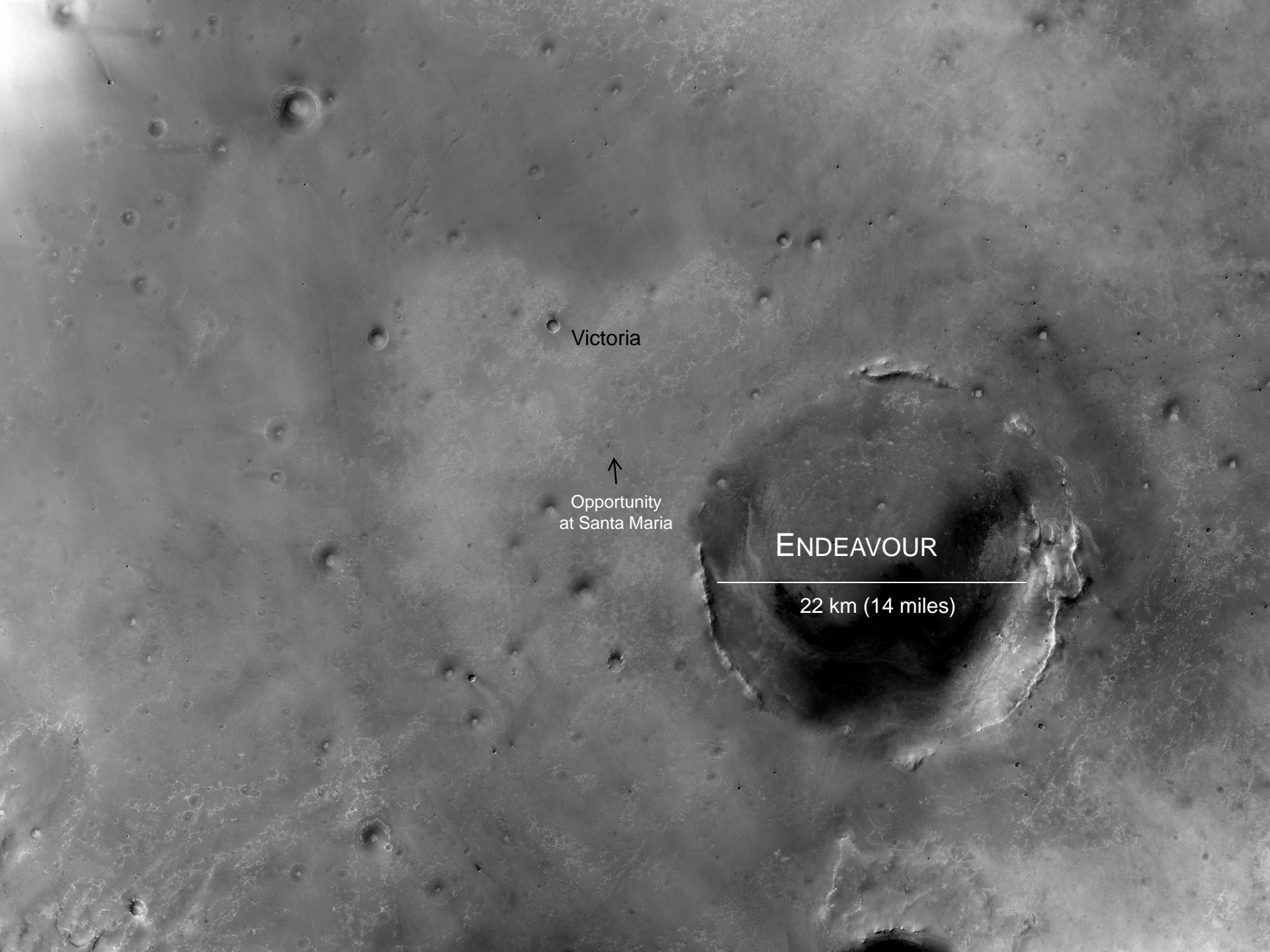
# Mars Reconnaissance Orbiter's Image of Victoria Crater and Redskins Stadium

## Example of Relatable Earth Analog



*Opportunity's View of Victoria Crater*





Victoria



Opportunity  
at Santa Maria

ENDEAVOUR

22 km (14 miles)

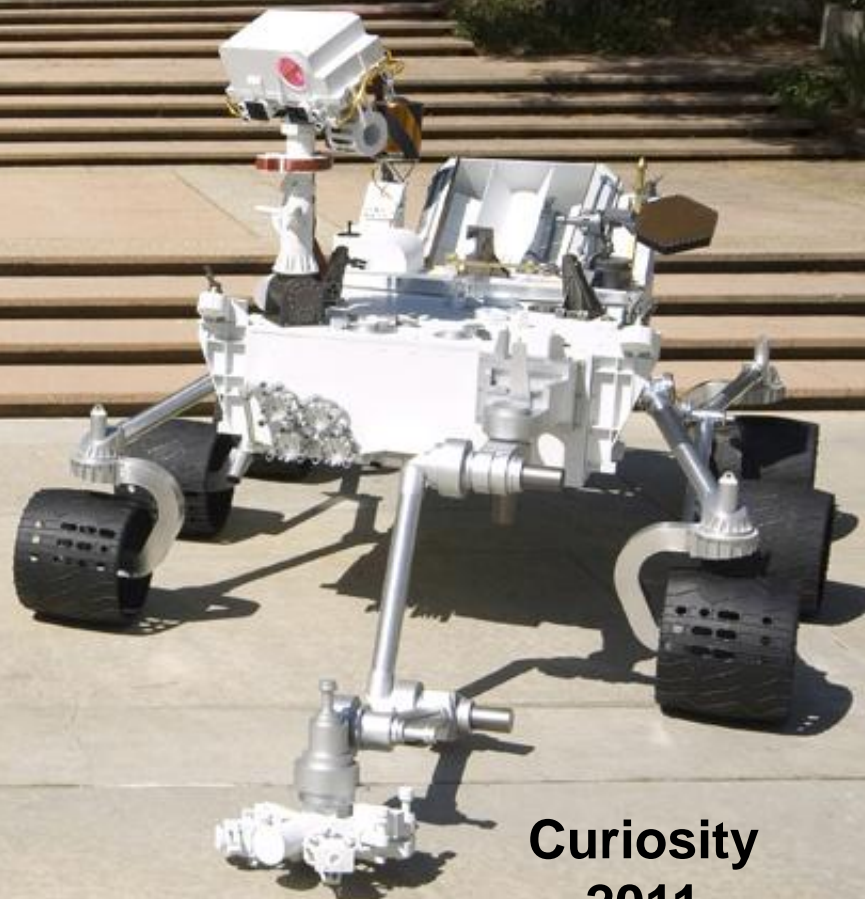
# Mars Family of Rovers



**Spirit and  
Opportunity  
2003**



**Sojourner  
1996**



**Curiosity  
2011**

# Curiosity Cam - <http://www.ustream.tv/nasajpl>

Over 3.3 million viewers



# Solar System Webpage Updated

 National Aeronautics and  
Space Administration

## Solar System Exploration

- Home
- News & Events
- Planets
- Missions
- Science & Technology
- Multimedia
- People
- Kids
- Education



Follow Us...   



### Home

Quick access to planets, missions, news and the most popular areas of the site.

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#### Featured

##### Most Popular

These are the pages getting the most attention right now on the site.



### Most Popular

[Planets and More](#) [Missions](#) [Images](#) [Downloads](#)



- 1 Solar System Lithograph Set
- 2 Explorers' Guide to the Solar System
- 3 Our Solar System Lithograph
- 4 Solar System Roadmap (2006)
- 5 2010 Science Plan for NASA's Science Mission Directorate

Most recent update: November 2009.

### Our People



**Thomas Valdez**  
Senior Member Engineering Staff

"Enjoy every opportunity you have to learn and make it a point to be involved in the most challenging projects."  
[More »](#)



# New Solar System Web Features



## Columnist: Dr. James Green: The REAL News In Planetary Science

The planetary science community is in the process of pulling off one of the greatest eras in planetary science, ever. [More ▶](#)

[Read the Column ▶](#)

Division Director Column ([solarsystem.nasa.gov/news/NWND.cfm](http://solarsystem.nasa.gov/news/NWND.cfm))



## 3D Interactive: Eyes on the Solar System

Explore the planets and their moons and ride onboard spacecraft, past present and future, exploring our cosmic backyard. All from your desktop. [More ▶](#)

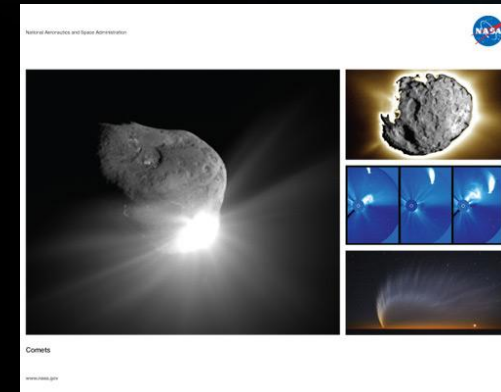
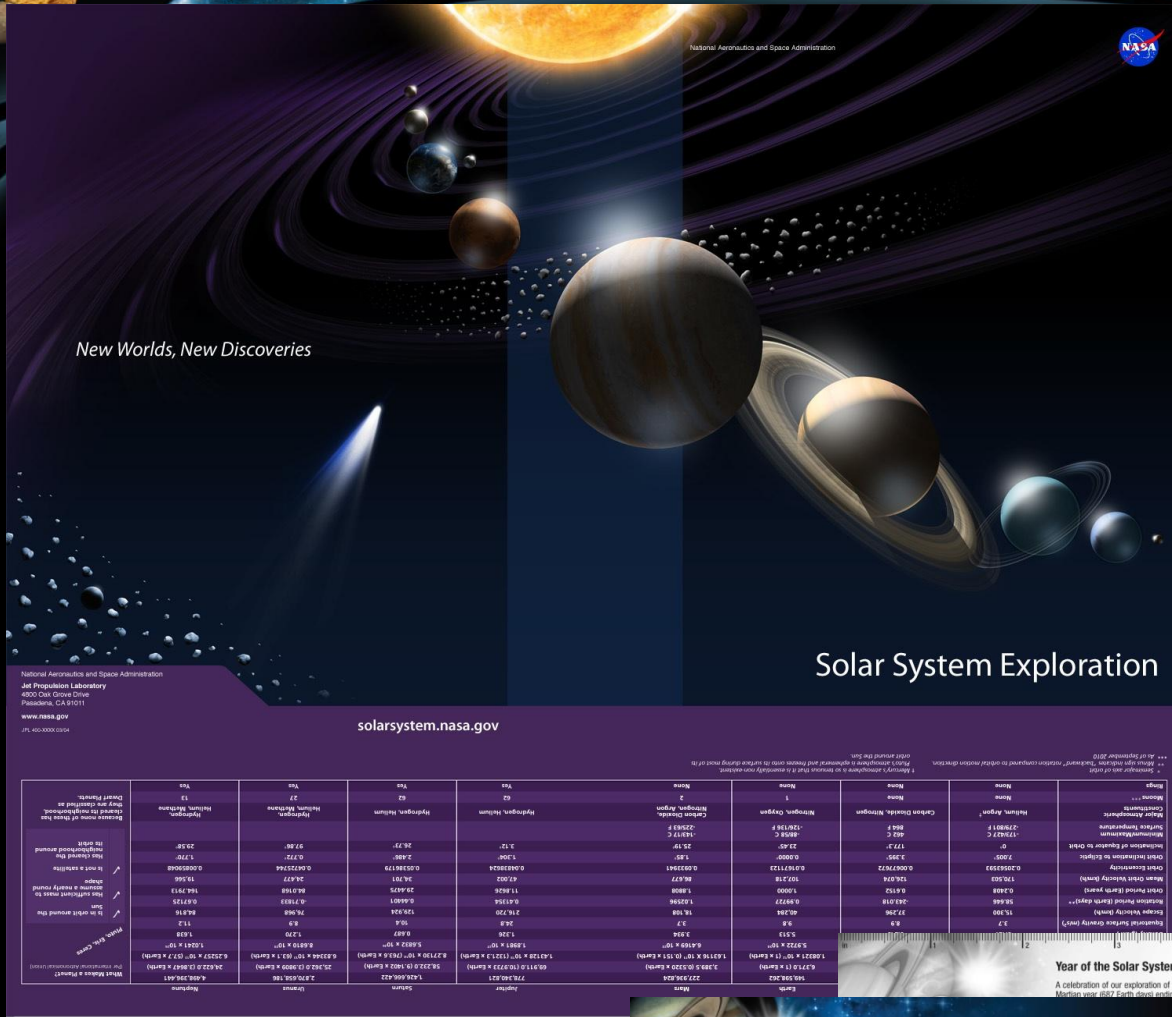
[Launch Eyes on the Solar System ▶](#)

[Got Feedback? ▶](#)

[More Beautiful Screenshots on Flickr ▶](#)

Interactive Feature: Eyes on the Solar System ([solarsystem.nasa.gov/eyes/index.html](http://solarsystem.nasa.gov/eyes/index.html))

# Examples of PSD Communication Materials



In addition to websites:

- Folders
- Bookmarks
- Free, downloadable Materials





# PSD Events and Activities Matrix Map to Metrics and Strategic Goals (to date)

Event	Web Address	Audience	Metrics (as of 02/07/2011)	Relationship to Strategic Goal
<b>PSD Event</b>			TBD, if not shown	
September 10 – 25 <sup>th</sup> Anniversary of the First Comet Encounter, Newseum	<a href="http://www.youtube.com/nasatelevision#p/u/201/YOT-lj6bv9M">http://www.youtube.com/nasatelevision#p/u/201/YOT-lj6bv9M</a>	General Public, Science Community		6.4
September 18 – International Observe the Moon night	<a href="http://observethemoonnight.org/">http://observethemoonnight.org/</a>	General Public		6.2, 6.3, 6.4
September 30 – Opening of Dulles Gateway Gallery	<a href="http://www.beyondexhibition.net">http://www.beyondexhibition.net</a>	Dulles Airport Travelers	10,000/day for 8 months	6.3, 6.4
October 1 – Year of the Solar System EPO kick-off	<a href="http://solarsystem.nasa.gov/yss">http://solarsystem.nasa.gov/yss</a>	EPO, Scientists, General Public		6.1, 6.2, 6.3, 6.4
October 3-8 – DPS, Pasadena CA	<a href="http://dps.aas.org/meetings/2010/">http://dps.aas.org/meetings/2010/</a>	Science Community, Early Career Scientists, Youth		6.1, 6.2,
October 14 – 50 <sup>th</sup> Anniversary of Astrobiology	<a href="http://www.livestream.com/astrobiology50th">www.livestream.com/astrobiology50th</a>	General Public, Science Community	714,800 viewer minutes, 140 attendees	6.2, 6.3, 6.4
October 23-24 – US Science and Engineering Festival	<a href="http://www.usasciencefestival.org/">http://www.usasciencefestival.org/</a>	General Public	500,000 total attendees	6.1, 6.2, 6.3, 6.4
October 26 – Public release of Eyes on the Solar System multimedia web feature	<a href="http://solarsystem.nasa.gov/eyes">http://solarsystem.nasa.gov/eyes</a>	Youth, General Public		6.2, 6.3, 6.4
October 27 – Library of Congress lecture by A. Davies on Volcanoes	<a href="http://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=5088">http://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=5088</a>	General Public	75 attendees	6.4
November 4 - TEDxNASA event @ Newport News, VA	<a href="http://www.youtube.com/view_play_list?p=9D5893159145F866">http://www.youtube.com/view_play_list?p=9D5893159145F866</a>	General Public		6.2, 6.3, 6.4
November 20 - TEDxYouth NASA event @ VASC and NASA Centers	<a href="http://www.livestream.com/tedx youthnasa">http://www.livestream.com/tedx youthnasa</a>	Youth	56,381 viewer minutes	6.2, 6.3, 6.4
December 2 – Astrobiology Announcement: Arsenic Organism	<a href="http://www.nasa.gov/topics/universe/features/astrobiology_toxic_chemical.html">http://www.nasa.gov/topics/universe/features/astrobiology_toxic_chemical.html</a>	General Public, Science Community		6.4
December 7 – Colloquium @ Virginia Air and Space Center	<a href="http://www.archive.org/details/Dr.JamesGreenVascPresentationCaptioned">http://www.archive.org/details/Dr.JamesGreenVascPresentationCaptioned</a>	General Public	350 attendees	6.4
December 13-17 – AGU	<a href="http://www.agu.org/meetings/fm10/">http://www.agu.org/meetings/fm10/</a>	Science Community, Early Career Scientists, Youth	19,500 attendees	6.1, 6.2,
January 13 - Mars Program Update @ NASM	<a href="http://www.livestream.com/mars">www.livestream.com/mars</a> and <a href="http://www.youtube.com/nasatelevision">www.youtube.com/nasatelevision</a>	General Public, Youth	103,900 viewer minutes	6.2, 6.3, 6.4
February 12-13 – SpaceUp Houston, LPI, Houston, TX	<a href="http://spaceuphouston.org/">http://spaceuphouston.org/</a>	General Public, Young Adults		6.3, 6.4
February 13 - Book signing “Jars to the Stars” at NASM	<a href="http://www.nasm.si.edu/events/eventDetail.cfm?eventID=2734">http://www.nasm.si.edu/events/eventDetail.cfm?eventID=2734</a>	General Public		6.4
February 20 – AAAS “Meet the Scientist” C. Conley, Washington DC	<a href="http://www.aaas.org/meetings/2011/program/fsd/">http://www.aaas.org/meetings/2011/program/fsd/</a>	General Public, Science Community		6.4
<b>PSD Activity</b>				
External Communications	<a href="http://solarsystem.nasa.gov">http://solarsystem.nasa.gov</a>	General Public	Aver. 400,000 unique visitors/month	6.1, 6.2, 6.3, 6.4
Internal Communications - Planetary Science Division	<a href="https://planetaryscience.nasa.gov/web/planetarysciencedivision">https://planetaryscience.nasa.gov/web/planetarysciencedivision</a>	PSD Team		
Year of the Solar System	<a href="http://solarsystem.nasa.gov/yss">http://solarsystem.nasa.gov/yss</a>	EPO, Scientists, General Public		6.1, 6.2, 6.3, 6.4
Eyes on Solar System Web-Based 3D Interactive	<a href="http://solarsystem.nasa.gov/eyes">http://solarsystem.nasa.gov/eyes</a>	Youth, General Public		6.2, 6.3, 6.4
Mars Rover - Curiosity Cam	<a href="http://www.ustream.tv/nasaapl">http://www.ustream.tv/nasaapl</a>	General Public	3.3 Million	6.3, 6.4
Executive Communications - Jim Green Column	<a href="http://solarsystem.nasa.gov/news/NWND.cfm">http://solarsystem.nasa.gov/news/NWND.cfm</a>	General Public, Science Community		6.4
NASA eClips - Solar System	<a and="" at%20is%20the%20solar%20system"&amp;category="1000&amp;disp=grid" href="http://www.nasa.gov/audience/foreducators/nasaclips/search.html?terms=" http:="" nasaeclips"="" user="" wh="" www.youtube.com="">http://www.nasa.gov/audience/foreducators/nasaclips/search.html?terms="Wh at%20is%20the%20solar%20system"&amp;category=1000&amp;disp=grid and http://www.youtube.com/user/NASAEclips</a>	Youth (K-5), General Public	Aver. 30,000 hits/month for all videos	6.2, 6.4
NASA eClips - Astrobiology	<a href="http://www.youtube.com/user/NASAEclips#p/c/D78EC5371822BDD9/0/H2xaFLR0">http://www.youtube.com/user/NASAEclips#p/c/D78EC5371822BDD9/0/H2xaFLR0</a>	Youth (9-12), General Public	Aver. 30,000 hits/month for all videos	6.2, 6.4



# Challenge to Science Community: *Science Isn't Done Until it Shared*

Focused research states that having Scientists & Engineers meet face-to-face with people makes a significant impact on their thinking

Talk to 3 people – Your neighbors, friends, family community groups

- Don't underestimate the power of the “personal connection”
- Why should the public care?

What 3 things do you want the public to know about your mission or planetary activity?

**Saturn**

**Earth**

